

POST-TERTIARY
FORAMINIFERA FROM A BORE
NEAR ROSEBUD, VICTORIA

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The material examined and reported upon in this paper was collected by Mr. R. A. Keble, now Palaeontologist of the National Museum of Victoria, during his survey of the Mornington Peninsula, when an officer of the Geological Survey, and is from Mines Department Bore No. 5, parish of Wannaeue, 177-187 feet. The location of the bore is approximately 4 miles from Rosebud, on the road to Flinders. The greater part of the sample consisted of fine grey sand, which passed through a sieve of 60 meshes to the inch. The balance was almost wholly organic in origin, being made up of bryozoa, foraminifera, ostracoda, and molluscan remains, all being so broken up or small as with a few exceptions to pass through a sieve of 40 meshes to the inch.

The following species of foraminifera, which are considered to be indigenous to the deposit, were met with:

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| 1. <i>Textularia sagittula</i> Defrance | rare |
| 2. <i>Clavulina multicamerata</i> Chapman | rare |
| 3. <i>Planispirina bucculenta</i> (Brady) | rare |
| 4. <i>Nubecularia lucifuga</i> Defrance | rare |
| 5. <i>Quinqueloculina</i> sp. cf. <i>lamarckiana</i>
d'Orbigny | very rare |
| 6. <i>Q. subpolygona</i> Parr | common |
| 7. <i>Q. costata</i> d'Orbigny | common |
| 8. <i>Q. seminulum</i> (Linne) | rare |
| 9. <i>Q. vulgaris</i> d'Orbigny | rare |
| 10. <i>Spiroloculina antillarum</i> d'Orbigny | very rare |
| 11. <i>S. milletti</i> Wiesner | frequent |
| 12. <i>Triloculina trigonula</i> (Lamarck) | rare |
| 13. <i>T. striato-trigonula</i> Parker and
Jones | frequent |
| 14. <i>T. circularis</i> Bornemann | rare |

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| 15. | <i>T. sp. aff. sublineata</i> (Brady) | frequent |
| 16. | <i>Pyrgo denticulata</i> (Brady) | rare |
| 17. | <i>Peneroplis planatus</i> (Fichtel and Moll) | rare |
| 18. | <i>Spirillina denticulata</i> Brady | frequent |
| 19. | <i>S. limbata</i> Brady | very rare |
| 20. | <i>S. inaequalis</i> Brady | common |
| 21. | <i>Lenticulina sp.</i> | very rare |
| 22. | <i>Planularia patens</i> (Brady) | very rare |
| 23. | <i>Vaginulina vertebralis</i> Parr | rare |
| 24. | <i>V. bassensis</i> Parr | rare |
| 25. | <i>Dentalina mutsui</i> Hada | frequent |
| 26. | <i>Lagena perlucida</i> (Montagu) | rare |
| 27. | <i>L. sulcata</i> (Walker and Jacob) | common |
| 28. | <i>L. acuticosta</i> Reuss, var. <i>ramulosa</i> Chapman | rare |
| 29. | <i>L. distoma-margaritifera</i> Parker and Jones | frequent |
| 30. | <i>L. distoma-margaritifera</i> , var. <i>victoriensis</i> Parr | frequent |
| 31. | <i>Fissurina contusa</i> Parr | rare |
| 32. | <i>F. orbignyana</i> Seguenza var. | rare |
| 33. | <i>Entosolenia williamsoni</i> Alcock | very rare |
| 34. | <i>E. squamosa</i> (Montagu) | frequent |
| 35. | <i>E. variata</i> (Brady) | frequent |
| 36. | <i>Guttulina regina</i> (Brady, Parker and Jones) | common |
| 37. | <i>Globulina gibba</i> d'Orbigny, var. <i>globosa</i> (Münster) | frequent |
| 38. | <i>Sigmoidella elegantissima</i> (Parker and Jones) | rare |
| 39. | <i>Bolivinella folium</i> (Parker and Jones) | frequent |
| 40. | <i>Buliminella elegantissima</i> (d'Orbigny) | rare |
| 41. | <i>Buliminoides williamsonianus</i> (Brady) | very rare |
| 42. | <i>Bulimina marginata</i> d'Orbigny (short form) | very rare |
| 43. | <i>Bolivina pseudoplicata</i> Heron-Allen and Earland | rare |
| 44. | <i>B. rugosa</i> , sp. nov. | common |
| 45. | <i>B. sp. nov.</i> | very rare |
| 46. | <i>Rectobolivina digitata</i> Parr | common |

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| 47. <i>Reussella armata</i> (Parr) | very rare |
| 48. <i>Pavonina flabelliformis</i> d'Orbigny | very rare |
| 49. <i>Uvigerina</i> sp. aff. <i>pigmea</i> d'Orbigny | very common |
| 50. <i>Angulogerina carinata</i> Cushman,
var. <i>bradyana</i> Cushman | rare |
| 51. <i>Patellinella inconspicua</i> (Brady) | rare |
| 52. <i>Discorbis dimidiatus</i> (Jones and
Parker) | common |
| 53. <i>Discorbis australis</i> Parr | common |
| 54. <i>D. australensis</i> Heron-Allen and
Earland | common |
| 55. <i>D. opercularis</i> (d'Orbigny) | common |
| 56. <i>D. williamsoni</i> Chapman and Parr | frequent |
| 57. <i>D. pulvinatus</i> (Brady) | very rare |
| 58. <i>Discorbinella biconcava</i> (Jones and
Parker) | frequent |
| 59. <i>D. disparilis</i> (Heron-Allen and
Earland) | rare |
| 60. <i>D. involuta</i> (Sidebottom) | very rare |
| 61. <i>Notorotalia clathrata</i> (Brady) | common |
| 62. <i>Streblus beccarii</i> (Linne) | frequent |
| 63. <i>Anomalina nonionoides</i> Parr | very rare |
| 64. <i>A. wüllerstorfi</i> Schwager | very rare |
| 65. <i>Cibicides lobatulus</i> (Walker and
Jacob) | rare and small, some
showing <i>Dyocibicides</i>
plan of growth |
| 66. <i>Planorbulina mediterranensis</i>
d'Orbigny | very rare |
| 67. <i>Acervulina inhaerens</i> Schultze | frequent |
| 68. <i>Gypsina vesicularis</i> (Parker and
Jones) | rare, hemispherical
specimens |
| 69. <i>Globigerina bulloides</i> d'Orbigny | common, small |
| 70. <i>G. inflata</i> d'Orbigny | common, small |
| 71. <i>Orbulina universa</i> d'Orbigny | frequent, small |
| 72. <i>Globorotalia pseudocrassa</i> Chapman
and Parr | frequent, small |
| 73. <i>Elphidium argenteum</i> Parr | very rare |
| 74. <i>E. advenum</i> (Cushman) | rare |
| 75. <i>E. verriculatum</i> (Brady) | rare |
| 76. <i>E. macellum</i> (Fichtel and Moll) | frequent |
| 77. <i>E. crispum</i> (Linné) | common |
| 78. <i>E.</i> sp. aff. <i>minimum</i> (Seguenza) | common |

This list of foraminifera may be compared with that given in a paper by the author (Parr, 1945). It will be seen that practically all of the species also occur in the shore sands of Barwon Heads. The remainder, with the exception of *Pavonina flabelliformis*, have been met with by the writer in other Victorian shore sands or in dredgings from Bass Strait. *P. flabelliformis* is typically a Recent Indo-Pacific species, although it occurs in the Pliocene of the Hamilton district, in western Victoria.

The following new species is described from the material:

BOLIVINA RUGOSA, sp. nov.

Text-figs. *a*, *b*.

Test comparatively small, from two and a half to three times as long as broad, only slightly compressed, rather regularly tapering throughout, with the margins lobulated, generally excavated along the median line, periphery broadly rounded, basal end blunt or pointed with a slight spine; chambers distinct in the latter stages,



numbering from 12 to 14 in the adult, in the early portion broader than high, later with the height and width about equal, later chambers strongly inflated; sutures distinct, oblique, deeply depressed in the later chambers; wall coarsely perforate, the surface of all chambers except the terminal half of the last thickened and rough, often with a ridge around the base of the early chambers and developing longitudinal lines of coarse beads on the later chambers; aperture elongate, with a pronounced lip, generally with the base removed a little from the inner margin.

Length, 0.6 mm.; breadth, 0.22 mm.; thickness, 0.14 mm.

Examples of this species are common. It shows some resemblance to *B. parri* Cushman, from the Pliocene (Castlecliffian) of Castlecliff, Wanganui, New Zealand, but differs in its deeply depressed sutures and much greater amount of ornamentation.

The holotype of *Bolivina rugosa* and examples of the other species recorded are being deposited in the National Museum of Victoria.

Associated with the Post-tertiary foraminifera are some species

which are undoubtedly derived from Tertiary deposits. They do not differ in preservation from the later forms but, in a long experience of Victorian fossil and living foraminifera, the writer has found them to occur only in the Tertiary. Fossil foraminifera, derived from nearby Tertiary deposits, were, it may be recalled, also associated with the Recent species in the shore sands at Barwon Heads.

The Tertiary foraminifera include a number of undescribed species, but the following may be mentioned with the known range of each:

<i>Cornuspira crassisepta</i> Brady	Balcombian-Janjukian
<i>Fissurina</i> sp. aff. <i>globosa</i> Bornemann	Balcombian (Batesford Sub-stage)
<i>Ehrenbergina</i> sp. aff. <i>mestayeri</i> Cushman	Balcombian-Janjukian
<i>Discorbis margaritiferus</i> (Heron-Allen and Earland)	Balcombian-Janjukian
<i>D.</i> sp. nov. (of <i>bertheloti</i> group)	Janjukian
<i>Eponides</i> sp. nov.	Janjukian
<i>Heronallenia</i> sp. nov.	Balcombian-Janjukian
<i>Ceratobulimina hauerii</i> (d'Orbigny), var. <i>australis</i> Cushman and Harris	Balcombian
<i>Siphonina australis</i> Cushman	Balcombian-Janjukian
<i>Anomalina</i> sp. aff. <i>rotula</i> d'Orbigny	Balcombian-Janjukian
<i>Planorbulinella inaequilateralis</i> (Heron-Allen and Earland)	Balcombian (Batesford Sub-stage)
<i>P. plana</i> (Heron-Allen and Earland),	Balcombian (Batesford Sub-stage)
<i>Sherbornina</i> sp. ? nov.	
<i>Annulopatellina</i> sp. nov.	

The genus *Sherbornina* is known only from one described species, *S. atkinsoni* Chapman, which occurs at Table Cape, Tasmania, and is also found in the Janjukian of Victoria. The present species appears to represent a new form. It is thicker than *S. atkinsoni*, and also has the centre of the upper surface more depressed. The species of *Annulopatellina* is also new, and is identical with a species which occurs in the clays intercalated between the limestones in the lower part of the section at Castle Cove, west of Cape Otway. This is low down in the Janjukian.

The source of these derived foraminifera remains to be considered. Tertiary deposits of Balcombian age now occur in the

sea floor at Balcombe Bay, Mornington, and between Point Lonsdale and Barwon Heads. The nearest Janjukian deposits are on the coast in the vicinity of Torquay. It appears probable that the foraminifera were washed out of these deposits or some unknown nearer deposits and carried along a tidal channel to the position in which they were found.

REFERENCES

1945. Parr, W. J. Recent Foraminifera from Barwon Heads, Victoria. Proc. Roy. Soc. Vict., 56 (n.s.), pt. 2, pp. 189-218.